Issue 57
August 2024

Utah Valley Amateur Radio Club

The UVARC Shack

Serious fun at Field Day

Once again, the queens of Field Day, Kelly Hooton KR1KET and Wendy Shoop KW3NDY dominated the airwaves and racked up the majority of our SSB (single sideband) contacts. Later that evening, they repeated their performance in the GOTA station. Huge thanks to those who contributed their RVs to the stations, plus Chad Bowcut KD7BKO for providing the GOTA trailer and the IT between stations. But thanks to ***you*** for helping make Field Day the description we kept hearing : fun!

In this issue of the *UVARC Shack*

Club meetings feature part 2 of SWR Mysteries, plus our Ham Radio Fair.

My Shack spotlights WA7YPL. *Amateurs in Action* in Ohio helping a family in Death Valley. *Brass Tacks* on amplifiers.

Dear Annette on how far apart to install antennas. *Hot Tips* on adding ham radio to your will. *DIY* for a foxhunt attenuator. *The Amateur in You* on vegetation and taking it personally.

Please send your ideas, stories, questions, gripes, and photos to ***uvarcshack@gmail.com***

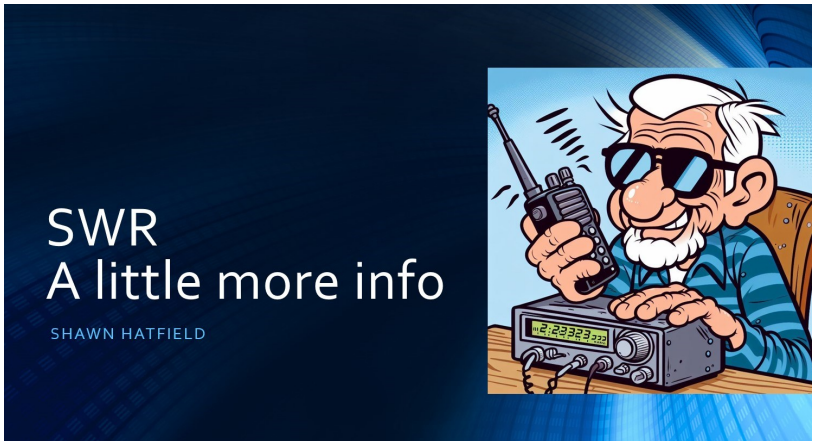
Inside this issue

Other points of interest

Club meetings

Recap

June 2024 club meeting – SWR Mysteries, Part 2



A follow-up to the February SWR presentation, Shawn Hatfield KJ7SNE rewarded us with the details of the effects of SWR, how to measure it, and what measuring instruments are good enough for amateur work. In fact, Shawn knows his stuff so well that he could teach it with his eyes closed. His presentation drew quite a lot of questions and comments from the crowd at Sage and Plow, where we met once again. You can see a video here, thanks to Trevor AG7GX.

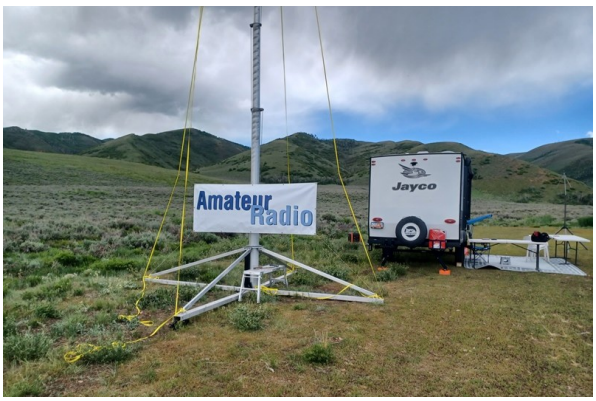
July 2024 club "meeting" – Ham Radio Fair

We had a terrific turnout at the Ham Radio Fair on July 18 at Pheasant Brook Park in Lindon. The club holds the fair in replacement of the regular monthly meeting, due to the proximity of Field Day, and to offer those who couldn't attend regular Field Day a way to gather and get on the air. Thanks to ham radio courses recently taught by Dave Becar KI6OSS, Joe Costello WH6QV, and Gavin Grow K9GKG, there were many new or prospective hams that attended as well. And that's good timing, since Jim Cooper W7KLA ran the New Ham Net right from the pavilion at the event. We've included a few photos on page XX.

By the way, many of our past meetings are recorded and posted on the club YouTube channel.

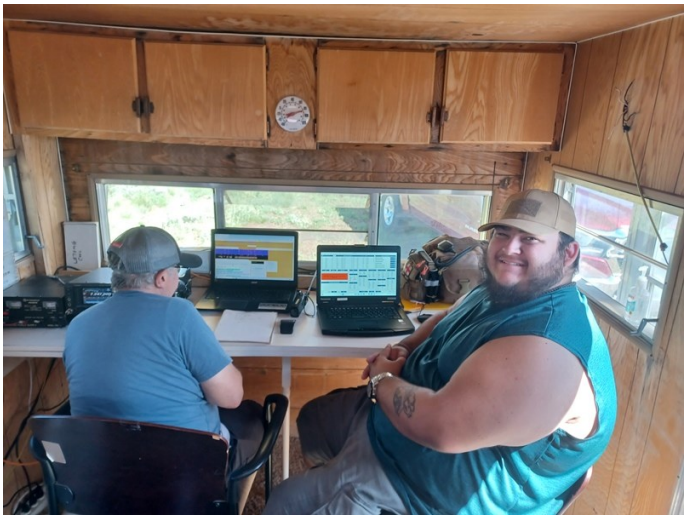
Field Day

In photos



Field Day

Continued



Field Day

Continued

My Shack

Highlighting the shack (ham equipment and room) of a member, to give others an idea of the possibilities that might work for them

Walt Nicholes WA7YPL

When I was 9 years old, my Dad got my brothers and me each a 100 mW Radio Shack "walkie-talkie" for Christmas. I was mesmerized by it. Although we had a lot of fun talking to each other on the only channel it had, Channel 7, the real test was talking to the East Lawn Cemetery near Provo Canyon from our home in Edgemont, about 2 miles away. WOW! I was hooked. But in those days a "real" CB transceiver was too expensive, so I just spent a lot of time wishing.

Jump forward 12 years and I was drafted into the US Army, and ended up in the Signal Corps. I was force-fed Morse code, and was taught basic radio operations — military style. Later I trained in radio teletype and then radio repair.

It was in Germany a year later when a ham approached my radio shed and asked if I had a license. I didn't, but under the rules he could administer the test for a "conditional class" license. Because of all of the Army training, passing the exam was a snap, and soon afterward, I became WA7YPL. I have kept that call sign throughout, and sometimes say WA7 Yelling Pretty Loud, which those who know me find unremarkable.

Along came kids, and relocations, and ham radio wasn't a practical pastime for me, but I built a Heathkit HW-101 and its power supply, and when I got a few minutes here and there, I spent a little time with it.

Jump forward to about 1998 when I met Jim Manookin N7XGA and he sold me on the idea of a 2-meter handheld transceiver. Again I got one from Radio Shack, and it works to this day. I was involved for years with the MARA net that he headed up.

And finally, in March of 2020 I retired. My wife and I discussed what I would be doing, and she suggested that I get back into ham radio. I had kept my license active, and I thought that was a good idea. She insisted that I get "good" equipment this time (what wife DOES that?) and I decided on an Icom IC-7300 for HF and an Icom IC-2730A for VHF/UHF. (Pictured in the photo.)

In the Army, we made our own antennas, so I made a VHF/UHF antenna out of cooper pipe stuff, and I strung a 204 -foot end-fed long wire up and over the trees in the back yard. Both appeared to have worked pretty well.

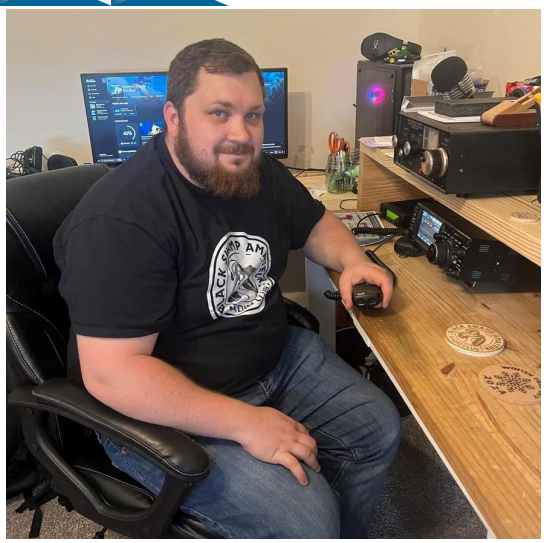
Lately I have fiddled some with digital modes, but I still prefer talking.

73, WA7YPL

Amateurs in Action

Recounts of ham radio operators who have used their effort and skills to help others in a time of need

Stuck in Death Valley



Caleb Gustwiller KD8TGB

On Friday 05 April 2024, Moritz Wacker KO6DZX and his family could not have picked a better weekend to take off and visit Death Valley National Park. After a five-hour road trip almost due north from their home in San Diego, the family made a campfire dinner and bedded down for the night. The next day brought a new adventure, as they started to explore Death Valley's wonders in their SUV. What they hadn't counted on was the mud that awaited them, and eventually Moritz got their vehicle stuck.

After numerous tries to get himself un-stuck, and being outside cell range, Moritz felt a small panic and decided to pull out his Xiegu G90 HF transceiver, connected it with some coax to a quarter-wave vertical, and tuned up on 10 meters. He started calling for help, asking whether anybody could pick up his signal. A fairly new ham, Moritz brought along his radio, in the off-chance that he could do a little contacting of his own. Now, it became a potential lifeline.

Across the country in Ohio, Caleb Gustwiller KD8TGB and Craig Rower KE8QJV, who live twenty miles from each other, picked up Moritz's distress call on 28.430 MHz. Other members of the Black Swamp Amateur Radio Club of Fayette, Ohio, also heard Moritz's faint signal, and posted the distress message on the POTA Facebook group. Others listening called the County Sheriff in Death Valley. More Facebook group members reached out to the National Parks Service police and alerted them.

Eventually, rangers found the family within a few hours of being alerted, and the Wackers made it back home safely that night. *It was an all-out effort from various locations*, said Caleb. *Without Caleb hearing this distress call*, said Craig, *it could have quickly become a very deadly situation for the operator and his family.*

Craig Rower KE8QJV

You can read more about the 10-meter rescue on the ARRL website and the BSARC website, and even a video on it.

New Hams and Upgrades

New hams

KK7TOZ = Royce Hackett
KK7TTQ = McKay Tenney
KK7TWV = Oaklee Roper
KK7TWW = Kelly Jensen
KK7TWX = Edwin Griggs
KK7TWY = Jeffren Roper
KK7TWZ = Robert Richards
KK7TXR = Carmina Chavez
KK7TXS = Rolando Chavez
KK7TZG = Bryan Wood
KK7TZH = Matthew Dolinar
KK7TZI = Heather Garrett
KK7UBM = Matthew Holt
KK7UBN = Mike Keller
KK7UBP = Raven Skousen
KK7UBR = Stan Boren
KK7UCF = Jana Shepherd
KK7UCG = Caleb Beazel
KK7UCP = Seth Bennion
KK7UEB = William Watson
KK7UEV = Eugene Bolinder
KK7UFD = Bradley Boice
KK7UGJ = Deluzevist Ghersi
KK7UGK = Rex Rowley
KK7UMU = Judson Flamm
KK7UMY = Caleb Densley
KK7UMZ = Indy Parker
KK7UNI = David Okerlund
KK7UNS = Cyle Cope
KK7UNY = Allen Carter
KK7UNZ = Christina Cope
KK7UOA = Bill Elieson
KK7UOB = Spencer Andrus
KK7UOC = Nicholas Betts
KK7UOK = Tom Johnson
KK7UOL = Dennis Miller
KK7UOM = Nathan Johnson
KK7UON -= Steve Metler
KK7UOO = Jessica Mitchell
KK7UOP = Celynn Pulsipher
KK7UOQ = Kimball Hewett
KK7UPB = Julie Carter
KK7UPC = Clint Harwood
KK7UPN = John Wright
KK7UPT = Roger Bosley
KK7UPU = Donald Sherman
KK7UPV = Andrew Tillack
KK7UPW = Tauna Berry
KK7UPX = Jessica Bosley

Upgraded hams

KK7PFL = Tom Wilkinson (General)
AI7YV = Blue Hunt (Extra)
KI7QCF = Forrest Stephenson (Extra)
KK7MNM = Jaxon Valerio (Extra)
N3VR = Nate Webb (Extra)
KJ1DAD = Keith Castleton (Extra)
KK7OYP = Tyler Castaldo (Extra)
KK7POC = Dakotah Bishop (General)
KK7RRU = Hal Shearer (Extra)

Congratulations to all these diligent folks! We look forward to hearing you on the radio soon.

Ham Radio Fair

In photos

Ham Radio Fair

Continued

Ham Radio Fair

Continued

Events

Upcoming happenings

UVARC 2024 Swap Meet

Heads up! The Utah Valley Swap Meet this year will be 9:00 am Saturday September 21, at the Spanish Fork North Park Pavilion, 1185 N 400 E. One of our few fund-raisers ever, entrance is $5 per person or $10 per family, plus $10 per table to display your wares. The *fee is waived* for outside clubs and service (ARES, RACES, CERT, etc.) groups who want to get the word out.

More than just a flea market, we hold this swap meet annually to provide

- Information on how to get active with many aspects of ham radio, such as HF, digital, APRS, POTA, SOTA, portable, solar, and much more
- A chance for service organizations to invite and inform attendees and recruit members
- Radio programmers who could program your radio on the spot

Bring stuff you want to get rid of or show off, or come and browse the many things that are for sale, in case you find something you need, or both. You'll find many give-away items as well.

Dave Becar KI6OSS plans hold an exam session at the swap meet just outside the pavilion, under the Laurel VEC. Watch for updates on FB and emails, as time progresses. This is a family event, and we'd love to see yours at the Swap Meet!

76ers Annual Ice Cream Social

It's time once again for the 76ers Annual Ice Cream Social, at Leatherby's in Orem, 304 E University Pkwy. Bring your family on Saturday September 7 at 1:00 pm and join us for lunch and treats. They have burgers, fries, and deli sandwiches, as well as world-class shakes, ice cream cones, sundaes, and parfaits.

Elections

The Utah Valley Amateur Radio Club will be holding our annual elections during the monthly club meeting on Thursday September 5 at 6:30 pm. Club members will be voting (in-person only) for the president, vice president, secretary, activities chair, and the technology specialist. If you'd like to throw your hat into the ring and run against any current posts, please let one of the leadership know, and they'll get your name on the election ticket.

DIY Night

Our November 2024 club meeting will be our annual DIY (do-it-yourself) night, where you can learn (or help teach!) a skill or concept to club members. This one will be held Thursday November 7 at the Orem Senior Friendship Center, 93 N 400 E starting 6:30 pm. Come learn about soldering, installing a connector, using Anderson Powerpoles, how to apply heat shrink, how to program a radio, how to set up your own mini-repeater, how to analyze an antenna, and more. Info as we get closer.

If you'd like to showcase a concept, please let one of the club leadership know. We'll give you a half-table to set up your demo and poster board or literature!

Brass Tacks

An in-depth look at a radio-related topic

Amplifiers

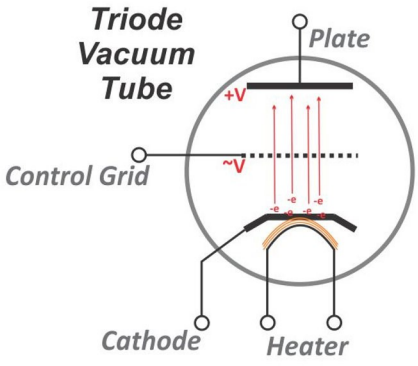
When you look at an innocently appearing antenna, it typically doesn't seem like it's doing much. Indeed, an antenna is merely a piece of conductive material reaching its fingers in the sky in an effort to snag some passing electromagnetic signals. And if the antenna is constructed appropriately, it can "catch" those signals quite well. But if you were to measure the strength of the signals picked up by the antenna, you might find that they're very weak. It's like feeling the slight breeze from a pair of fluttering butterfly wings from across the room.

To bring the received signal up to a meaningful (manageable) level requires increasing its strength without compromising its integrity. This process is known as ***amplification***, and it's achieved by a component, circuit, or device known as an ***amplifier*** (or ***amp*** for short). The title of this article might more aptly be named after the process, because the focus is more on the effect than a piece of hardware.

The vacuum tube amplifier

In 1907, Lee de Forest invented the electronic amplifier when he noticed that he could linearly modify a large current exiting a vacuum tube by a smaller current entering the tube. This feat alone transformed the world of electronics and gave birth to the broadcast radio industry. It also spelled the end to spark-gap transmitters by creating a safer, more efficient, and less-expensive means of generating a CW (continuous wave) signal.

A ***vacuum tube*** is nothing more than a small, evacuated glass bottle with some conductors inside it, connected to the outside by ***electrodes***. Let's imagine such a glass bottle with five electrodes protruding from it, like in the diagram to the right. Two of the electrodes are connected internally to two ends of a ***heater*** filament, to heat up a piece of metal we call the ***cathode***., which is connected to a third electrode. A fourth electrode is connected to another piece of metal we call the anode, or ***plate***. Edmond Becquerel discovered that heating the cathode metal with the heater like this will cause the cathode to emit (throw off) electrons in all directions.



Later, John Ambrose Fleming discovered that when he connected a voltage source across the cathode and the plate while the cathode was heated, the electrons that flew off the cathode were attracted to the plate, allowing electrons to flow from the cathode to the plate and completing a circuit. When Lee de Forest placed a small metal wire ***grid*** (screen) in the glass bottle and connected it to a fifth electrode, he discovered that he could apply a small controllable voltage to the screen, which repelled some of the electrons. This grid allowed him to *control* the flow of electrons from the cathode to the plate.

Brass Tacks

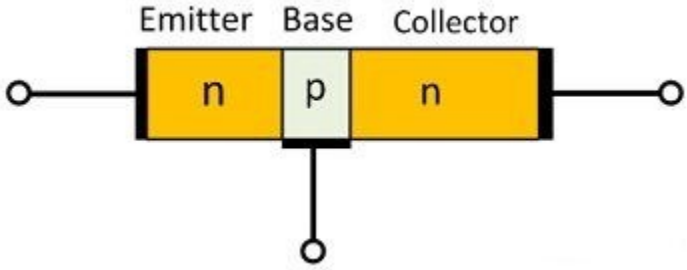
continued

If we had such a glass bottle with five electrodes placed as described, we could introduce a variable voltage to the grid, which would result in a much larger but proportional variable current between the plate and the cathode. If we then used a microphone to create that small variable voltage on the grid, and connected the plate to a speaker, suddenly our voice into the microphone could be heard with a much greater loudness at the speaker. This increase of volume loudness is known as *amplification*, and is a basic description of how to use a vacuum tube *triode* (three electrodes, the cathode, grid, and plate) to create an amplifier.

While a number of high-powered amplifiers, such as those found in broadcast stations and military installations, are still developed and manufactured using vacuum tubes, today's amateur radio (RF) and guitar (AF) amps are built largely using solid-state devices.

The solid-state amplifier

In the mid-20th Century, researchers discovered that if they added a poisonous impurity to non-conducting silicon, the material can act as a conductor under certain circumstances. When they placed a voltage source across this material, it remained an insulator, but when they applied a small controllable voltage to a spot on the side of the material while the voltage source was applied to it, the material began conducting current. In fact, the current that flowed between the voltage source connections was proportional to the voltage applied to the side, once again introducing amplification, but not by a vacuum tube.



This three-electrode, solid-state device is known as a ***transistor***, which has replaced the vacuum tube in most amplifier applications, due to its energy efficiency, smaller size, and lower cost. The transistor is said to be ***solid-state*** because it contains only solid components, unlike a vacuum tube, which is evacuated except for the gaseous cloud of electrons that provide the conduction mechanism. And because a transistor is made from a material that conducts electric current conditionally, it's called a ***semiconductor***.

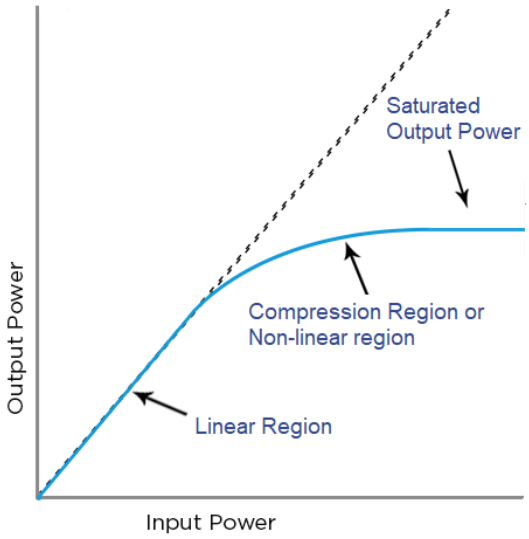
Semiconductor amplifiers can be made very small, very powerful, possess high noise immunity, high transfer speed, are inexpensive, and are easily manufactured. These and other advantages place the solid-state amplifier in nearly every electronic device on the planet. And the variety of amplifiers available to the designer and the experimenter as a result, are a huge convenience that also promotes unprecedented creativity.

Brass Tacks

continued

Linearity, gain, compression, saturation

If the output power of an amplifier is a simple multiple of its input, the relationship can be graphed as a straight line. Because of this, we refer to such a device as a ***linear*** amplifier. The amount of output power compared with that of the input signal is a multiplier known as amplifier ***gain***, often abbreviated by the letter G (gain) or A (amplification), often expressed in dB or dBm (dB with respect to milliwatts).



It's not possible for an amplifier to be infinitely linear (dotted line); that is, a linear amplifier can amplify an input signal up to a specified maximum, beyond which the output signal can result in little to no amplification. The region (span of input power levels) in which the increase of input power results in a reduced (less than linear gain) increase in output is known as the ***non-linear region*** or the ***compression region***. The region in which an input increase results in no output increase is a condition known as ***saturation***.

These parameters can be important to understand when considering or designing an amplifier for a specific application. For example, if you need an amplifier circuit of 6 dB gain (in other words, A = 4) that must amplify a signal between 100 mW and 1500 mW, but a proposed circuit saturates at 5 W, then the circuit will likely introduce distortion or clipping when the input is driven too high (1.5 W × 4 = 6 W, which is greater than the maximum 5 W).

If a signal is driven in the compression region, not only is the amplification no longer linear, but it can generate non-linear products. Undesirable harmonics, intermodulation, noise, and other spurious signals can result from the non-linear relationship between the input and output of the amplifier. And because the gain relationship is no longer purely linear, the graph of this effect appears to compress the line, and we refer to it as ***gain compression***.

In an audio amplifier, gain compression can result in distortion, a hum, or even an undesirable improvement in timbre or tone quality. (How can an improvement be undesirable? I suppose like a flower can be a "weed" in your watermelon garden.) If a gain-compressed signal is sent from a transmitter through an antenna, recipients might report that you sound a little like Donald Duck, or like you have a bad cold.

In many cases, neither you nor your contact might notice anything resulting at all from gain compression, but instead, your signal might be heard on a different band altogether, like the Police band. Not good. To avoid this sad situation, 1) understand the spread of the linear region in your amplifier and 2) do your best to remain within that region by not increasing the input power level beyond the point where the signal begins to exhibit non-linearity.

Brass Tacks

continued

The power amplifier

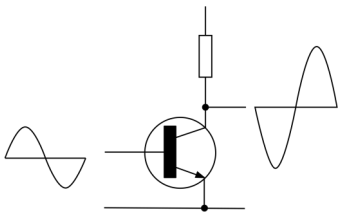
Some amplifiers are designed to output a high amount of power; that is, they possess the ability to present a greater voltage and allow for a higher current draw than is typical with smaller component amplifiers. These find applications in broadcast stations, military communication facilities, servo motors, and yes, ham radios. A ***power amplifier*** (PA) is typically the final stage in a series of signal-handling circuits, and so is often simply referred to as the *final power amplifier*, or ***final*** for short. So, when you hear that somebody has *blown his finals*, you now know that a final power amplifier, especially its power transistor, in his rig has met its demise.

Because of the amount of energy that must be conveyed through a power amplifier, particular attention is paid to its ***efficiency***, since power losses are exaggerated at higher power levels, as evidenced by the heat felt near them during operation. But not all power amplifiers are created equally, and some are designed to fill particular needs, in spite of their inefficiencies or other seeming drawbacks.

In general, power amplifiers can be categorized by the component they're intended to drive (feed power into) and the frequency range of their operations. The audio power amplifier is designed to drive a loudspeaker, the RF (radio frequency) power amplifier is designed to drive an antenna, and a PWM (pulse-width modulation) power amplifier is designed to drive servo motors.

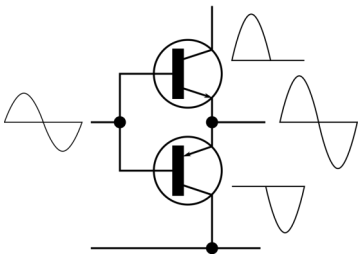
Power amplifiers of all three categories are divided into letter designations that define their modes or ***classifications***, each with its own set of advantages, disadvantages, and purposes. Some of them are characterized by the percentage of each cycle that's used for the amplification function, often noted by an angle (portion of the 360˚ cycle), but let's simply list them by percentage of the cycle. Here's a summary of the most common power amplifier classes:

Class A



- Characteristic: linear, uses 100% of the cycle
- Efficiency: 25%
- Advantages: simpler, less expensive, better high frequency performance, highest audio fidelity
- Disadvantages: lots of wasted power
- Applications: audio amplifiers, op amps

Class B



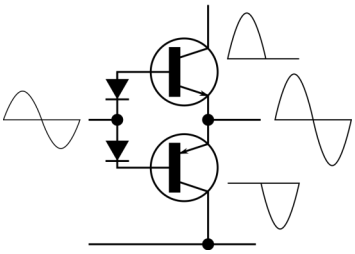
- Characteristic: linear, uses 50% of the cycle, push-pull architecture (to remove even-order harmonics)
- Efficiency: 60% to 78.5%
- Advantages: high efficiency
- Disadvantages: crossover distortion, significant harmonic distortion
- Applications: small, inexpensive, or toy electronics

Brass Tacks

continued

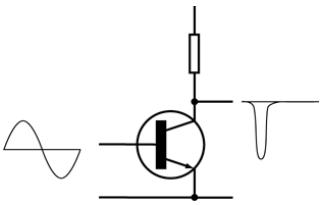
Class AB

- Characteristic: linear, uses more than 50% of the cycle, push-pull architecture (to remove even-order harmonics)
- Efficiency: greater than 60%
- Advantages: crossover distortion nearly eliminated, good compromise between Class A and Class B amplifiers
- Disadvantages: sacrifices some efficiency over linearity
- Applications: audio amplifiers, amateur radio transceivers and stand-alone amplifiers



Class C

- Characteristic: nonlinear, uses less than 33% of the cycle, distortion can result when used for a single sideband signal
- Efficiency: 60% to 70%
- Disadvantage: poorest linearity of all amplifier classes, heavy distortion, not fit for audio amplification
- Applications: HF sine wave oscillators



Class D

- Characteristic: nonlinear, uses PWM switching technology to achieve the highest efficiency, 100 dB dynamic range, smallest footprint
- Efficiency: greater than 80%, sometimes reaching nearly 100%
- Advantages: efficient switching amplifier, more efficient than linear amplifiers because they are at saturation or cutoff for most of the cycle
- Applications: control motors, servos

Other classes

Other power amplifier classes, such as E, F, G, H, I, S, and T exist, but are merely variations of ones already mentioned, and differ largely by signal type and efficiency.

The RF power amplifier

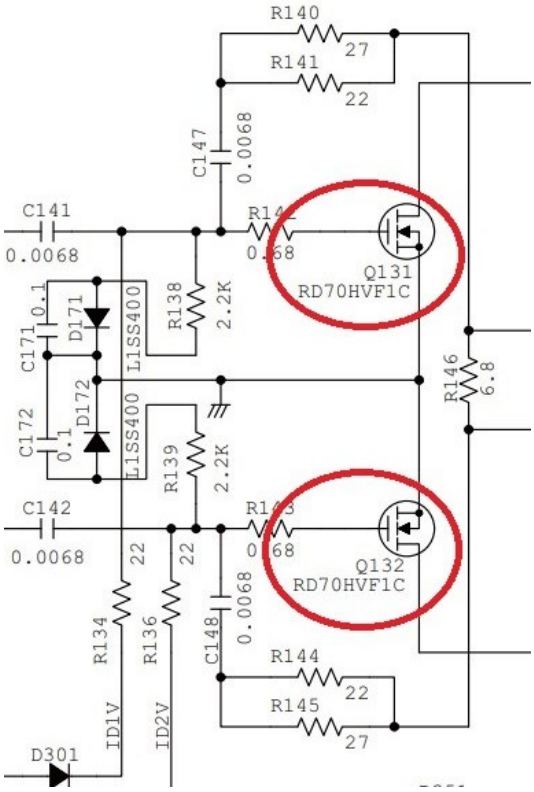
Because the presumed readership of this discussion likely has a deep interest in radio, here are a few last thoughts about the RF power amplifier. First, an amplifier is called *push-pull* because it contains two transistors, one of which is active during the first cycle half, to pull the current from the output (load), and the other is active during the second half, to push the current to the output. Advantages of a push-pull amplifier over other types include high efficiency, higher power output, cancellation of even-order harmonics, and generation of less distortion for the same power.

Second, many of today's radio finals are outfitted with MOSFETs (metal-oxide-semiconductor field-effect transistors). The Icom IC-7300, for example, uses a pair of Mitsubishi RD70HVF1C

Brass Tacks

continued

N-channel MOSFETs in a type of Class AB push-pull configuration, as shown in this schematic snippet:



PA section of the Icom IC-7300

Power transistor of the Icom IC-7300

The differential amplifier

The op amp (operational amplifier) is an off-the-shelf, pre-designed circuit amplifier whose functions and properties are configurable by adding components between its inputs and output. An op amp can be wired to produce a variety of waveforms, including triangular, sawtooth, square, and sinusoid. It can also be used to produce a variety of functions, such as filtering, oscillation, and yes, amplification.

An op amp is a special case of a ***differential amplifier***, in that its input is a pair of signals, whose output is determined by the difference between the input voltages, multiplied by the amplifier gain. In many differential signal applications, the input signals are reverse polarity (inverted) from each other, resulting in an amplified difference of twice the input signal amplitude. This feature gives the signal added resistance to noise, including that from common-mode, allowing for improvements in signal and impedance integrity over larger distances.

A variety of differential amplifiers are available for other two-wire applications, such as twisted

Brass Tacks

continued

pair phone, USB, ethernet, standard serial (RS-422), SATA, PCI Express, InfiniBand, DisplayPort, microstrip, DDR SDRAM, and HDMI. As you can see, most high-speed serial digital transmission lines terminate in a differential amplifier designed to boost their signals.

The stand-alone amplifier

A radio amateur tends to envision an *amplifier* as a unit that's attached to an amateur radio transceiver to boost its power. Although we've focused on the amplification process and the circuitry that provides the function, this article would be incomplete without including a section dedicated to ***stand-alone*** amplifiers. Our purpose isn't to help you operate, care for, or troubleshoot your amplifier, but simply to understand a little about it.

For the purposes of amateur radio, a stand-alone amplifier tends to be a linear type that covers 160 meters through 10 meters, or even 6 meters. The unit might require 240 VAC to power it, if it's designed to deliver more than, say, 1000 watts. An amplifier might require an external power supply, or include a built-in supply, which can make the unit quite heavy. Most can work with any modern amateur radio HF transceiver.

Stand-alone amateur radio linear amplifiers are available to purchase in a variety of choices, such as tube vs. solid-state, maximum output power, and whether they have an internal power supply. Their features might include automatic operation, a front panel control (even color) display, and a built-in autotuner. Distributors can advertise a variety of parameters as selling points, such as dual-power (both 120 VAC *and* 240 VAC), harmonic emissions suppression, external (CAT or serial port) control, low intermodulation distortion, and internal (thermal, fold-back) protection circuitry.

Here are a few samples of stand-alone amateur radio HF amplifiers, to give you some idea of available products and their features, along with their prices, as of the date of this article:

ACOM 1200S

Price: $4275

- Output: 1200 watts
- Type: solid-state
- Bands: 160 meters to 6 meters
- Tuner: built-in autotuner
- Weight: 32 lbs
- Powered by: 240 VAC

Ameritron AL-80B

Price: $2300

- Output: 1000 watts
- Type: tube
- Bands: 160 meters to 15 meters
- Tuner: none
- Weight: 48 lbs
- Powered by: 120 VAC

Brass Tacks

continued

FlexRadio Power Genius XL Price: $6000

- Output: 1500 watts
- Type: solid-state
- Bands: 160 meters to 6 meters
- Tuner: built-in autotuner
- Weight: 38 lbs
- Powered by: 240 VAC

Palstar LA-1K Price: $3700

- Output: 1000 watts
- Type: solid-state
- Bands: 160 meters to 6 meters
- Tuner: none
- Weight: 27 lbs
- Powered by: 240 VAC

SPE Expert 1.5K-FA Price: $5600

- Output: 1500 watts
- Type: solid-state
- Bands: 160 meters to 6 meters
- Tuner: built-in autotuner
- Weight: 21 lbs
- Powered by: 240 VAC

ACOM 500S Price: $3400

- Output: 500 watts
- Type: solid-state
- Bands: 160 meters to 6 meters
- Weight: 18 lbs
- Powered by: 240 VAC

RM Italy MLA100 Price: $760

- Output: 100 watts
- Type: solid-state
- Bands: 160 meters to 6 meters
- Weight: 3 lbs
- Powered by: 13.8 VDC

Brass Tacks

continued

When considering whether to purchase a stand-alone amplifier unit, you should ask yourself whether you really *need* one, or whether a *better antenna* can serve you more. Many who have purchased a stand-alone amplifier claim 1) they believe they could be heard much better, as evidenced by numbers of good reports during contesting, 2) their locations (due to obstructions) demands more power than barefoot stations can provide, and 3) in an emergency, their signals could let them be of service to a lot more locations around the globe.

Finally

Due to the myriad applications, the field of electronic amplifiers is huge, so I had to limit our discussion to their very basic definitions, functions, and purposes. Important topics not covered include feedback, dynamic range, noise, stability, self-oscillation, slew rate, delay, thermal runaway, and third-order intercept.

For stand-alone amplifier units, I didn't cover care or usage, which are large topics in themselves. The interface between an appliance amplifier and a transceiver can be difficult to configure, but later models have become much more intuitive and user-friendly. As solid-state electronics become more robust and available, more stand-alone units are moving away from tube designs. The need for tube warmups, plate current monitoring, and load adjustments are becoming a thing of the past.

Summary

Invented in 1907, the electronic amplifier is a circuit or device that can increase the power level of a signal. The vacuum tube was the first device used for electronic amplification circuitry, and it works by controlling a relatively high output current proportional to a smaller input current. Most of today's amateur and other applications employ solid-state amplifiers, which use transistors to perform the amplification function. Power amplifiers are specially classed because of their function as device drivers, among which the RF PA is particularly applicable to many amateur radio finals. A stand-alone amplifier is a device that can be acquired separately to provide power amplification for existing transceivers.

Noji Ratzlaff, KNØJI (kn0ji@arrl.net)

Dear Annette

What's on your mind? Serious, humorous, technical, and thoughtful answers to your deepest, (mostly) ham-related questions.

Dear Annette:

Should I turn off my mobile radio before I turn off my car's ignition, or is it ok to leave the radio on when I turn off the ignition?

Jeff in Pleasant Grove

Dear Jeff:

In the past, there were mobile radios that were damaged or lost their programming after they were left on while you started the engine, because the transceiver was unable to handle the poorly regulated vehicle voltage during ignition. Most of today's mobile radios are designed to be robust enough to handle the erratic voltage supply. So, if you forget to turn off your radio before you turn off your ignition, the rig will likely survive.

Dear Annette:

Is it better to bury coax by itself, or place it inside PVC, then bury the PVC pipe?

Tony in American Fork

Dear Tony:

On one hand, if you bury coaxial cable, be sure to purchase one that is rated as DB (direct-burial) type. Then, bury it deep enough to never likely get struck after you've forgotten where you've buried it, and start digging again. On the other hand, if you route your cable through PVC pipe, your cable should survive better if you ever accidentally strike it while digging or if rodents start chewing through it. Also, it's more convenient to remove coax from a pipe if you ever need to replace or upgrade it. But, always count on buried PVC pipe getting filled with water, which is not the best environment for a coaxial cable jacket, especially when the water freezes. And by the way, if you use PVC, I recommend that you also route some string alongside the coax, in case you ever need to add another cable in parallel.

Dear Annette:

How closely together can I install my HF and VHF antennas? How about two VHF antennas?

Michael in Cedar City

Dear Michael:

Assuming no two of these closely installed antennas will ever be used for signal transmission at the same time, your primary concern will likely be unwanted coupling. That is, conductive objects near an antenna can be capacitively coupled with the antenna, *making it part of the antenna*, which can throw off its feed point impedance, and therefore its SWR. The traditional quarter-wavelength separation works well for VHF antennas, but is impractical for HF antennas. A second concern is minimization of the transmitted signal entering the receiver of the non-transmitting antenna. To achieve this, every foot of separation (depending on the antenna pattern), should result in about 10 dB of signal reduction (in other words, 50 watts from an antenna can result in about 50 milliwatts picked up by an antenna three feet away). In general, the tolerated proximity will be frequency-dependent, but for amateur use, I recommend at least two feet of separation between any two antennas.

Dear Annette:

Cut to the chase. Which power supply is the best bang for the buck and will serve all my needs?

Scott in Draper

Dear Scott:

The $140 Powerwerx SS-30DV. Chase cut.

Got a question for Dear Annette*? Email it to* ***uvarcshack@gmail.com*** *and include your town name. Sorry, no guarantees.*

The Amateur in You, Part 1

What have you been pondering?

Working near trees and other vegetation

People who have several tall or leafy trees in their yards sometimes wonder whether the plants can interfere with their signals, either transmitted or received. Also, you might have asked before setting up a station in the woods, like for a race or a special event, whether doing so will work in spite of the surrounding vegetation.

Vegetation can affect performance

On one hand, trees, shrubs, and other vegetation ***can*** affect radio signal performance. On the other hand, just how much it affects its ability is density-dependent and frequency-dependent. While radio signals do not seem to be impeded much by wood, it's attenuated (reduced in signal strength) much more so by moisture content. So, leafy trees will tend to interfere more than a bunch of bare branches, and in wintertime, evergreens tend to absorb radio signals more than other tree types.

If you have a few trees on your property, your VHF and UHF signals are not likely to be affected by them, even if your antenna is installed right on a tree itself. If your station is set up within a *forest of trees*, your VHF and UHF signal can be affected much more, especially if the trees are covered with snow or fresh rainwater.

If your radio signals are lower in frequency such as in the HF range, the plant life should have little effect on your signals. But running at higher than 1 GHz, especially on microwave frequencies, even sparse vegetation can absorb your signals, producing a profound attenuating effect on them.

Vegetation can be overcome

If you do discover that your VHF or UHF radio signal has been compromised by vegetation, you can often overcome its effects by installing a better antenna. Rather than relying on a simple whip antenna for your HT, try connecting it to an external half-wave antenna, such as a J-pole, or a mobile antenna set on a ground plane. You can even improve on those by using a colinear vertical antenna. And if that's still not enough, you might need to use a Yagi antenna, which exhibits high gain, but at the cost of directivity.

You can also get around some vegetation interference by raising your antenna higher and / or increasing your transmit power. Keep in mind that changing your transmit power will do little for your reception. If you find it difficult to get your antenna above the tree canopy, mounting it at a location that's a little higher up on a nearby hill slope might help your signal tremendously.

Another way to reduce interference imposed by trees and shrubs is by narrowing the bandwidth of your signal. Most VHF and UHF radios have a *Narrow* bandwidth setting that might prove useful, as long as radios on both ends of the signal use the same bandwidth setting. On an HF rig, using a narrow-band filter can produce like results, such that CW communication can penetrate a forest a lot easier than a similarly powered SSB signal.

Noji Ratzlaff, KNØJI (kn0ji@arrl.net)

The Amateur in You, Part 2

What have you been pondering?

Don't take it personally

We're surrounded by a great community of ham radio operators, who tend to be helpful, friendly, and kind. There are times, however, when we might become a little offended at something another person has said to us. We've had training topics that have helped us be more patient and understanding on the radio, but this time, let's focus for just a minute on how we might react when we're on the receiving end of the offense.

We're intelligent beings, yet with that intelligence comes sensitivity; our egos are fragile and bruise easily, especially in today's world. Furthermore, people can be thoughtless and careless with their words, and many don't even know that their speaking habits can be abrasive to others.

You can't really help how you feel, because your feelings are the cocktail result of culture, up-bringing, past experiences (including toxic treatment by others), and your mental health, including possibly your anxiety levels, fears, and trauma.

No, it's not always easy, but here are a few things you can do, if you feel that another person has hurt your feelings, or even mistreated you, on the radio or elsewhere:

- Take a deep breath; if necessary, take a brief *time-out*

- Calmly ask for a clarification; a misunderstanding is often more likely than a direct insult
- Don't assume the worst; give the other person the benefit of the doubt
- Ask yourself whether the person truly meant to say what he or she had said
- Never react by lashing back with unkind words; retaliation only places you on the same level with the offender
- Although it might have been hurtful at the time, ask yourself whether the offense was truly that important, and whether you can turn the other cheek and let it go

Ham radio is not made from a single personality type, but instead is a community of a very diverse set of customs, habits, and languages. We've all come together for the common cause of amateur radio, yet the craft has attracted good folks from all walks of life, good folks like you.

Hot Tips

Good info for the new ham, and old stuff to refresh your memory

Add ham radio to your will

After all these many years, you've no doubt acquired quite the collection of amateur radio gear, most of it still very useful. But, some day you'll be faced with your own mortality, and somebody else will need to do something with all that equipment. If you specify in your will what you'd like done with it, that takes the guesswork out of it. But wait...you ***do*** have a will, don't you?

A ***will*** is a legal document that informs the living of your intentions for your estate once you die. Your ***estate*** is everything you own or have control over, such as your money accounts, property, house, corporate ownership, guardianship, and yes, ham radio gear. It's possible for you to pass away at any time, and without a will, all your belongings can be claimed by people through no choice of your own, or by the state, or even discarded to the local landfill. But that's not the biggest problem solved by a will.

When you leave this mortal life, whom do you expect to pick up the burden of removing all your ham radio equipment? Your spouse? Your local ham radio club? A couple of close friends? Nobody? Whomever they are, they'll need to make some decisions, such as whether to donate the gear or sell it, to clean it or distribute it as-is, to give it away or throw it in the trash. And if they do decide to sell it, will your spouse or relatives know how much they should expect from the sales?

Here are a few things you can do, to prepare for that inevitable day:

- Make a will (surprisingly easy), and include a section that instructs survivors how to deal with your ham radio equipment
- List in that section the equipment you consider of worth, and how much (in USD *today*) you believe they're worth if you anticipate them being sold
- List which items can be donated, indicating that the items not listed can be trashed (as valuable as you think your DIY equipment is, most people will not want to inherit much of what you've made)
- Indicate who should take care of distributing your equipment (this can be a very heavy burden for your spouse, by the way), or allow the Executor to assign somebody
- Label your equipment, whether it's of worth or not (including the mods made to them), so that it's clear what should be its destination following your demise
- Investigate, then note in the will, how much it's going to cost, to take down your tower or antenna structure (including a contractor to rent a crane or bucket)
- Notarize the will, and inform significant others of the document, and of this section
- Finally, if you believe that you'll soon leave this frail existence, prepare in advance by getting rid of as much ham radio equipment as you can live without, even in stages, until the big day

If you're ready to start selling off some of your equipment now, you can list them on the Schulman Auction Group, who specializes in selling ham radio gear for you, or a yard sale Facebook group. If you want to specify a recipient of your donations, your local ham radio club or school might make a good choice.

Just remember that doing nothing is simply not likely to end up well; be considerate enough to manage this final matter.

DIY

Worthwhile projects you can build on your own

Foxhunt 2-meter active offset attenuator

The radio pastime known as *fox hunting* involves searching for a hidden transmitter ("fox") and can be both fun and educational. It's part of a larger activity known as RDF (radio direction-finding, or ARDF for us amateurs), in which a participant searches for a radio signal source by using a variety of equipment and techniques. Of course, a 2-meter radio is used as a receiver, to pick up the fox's signal, but more importantly, the operator must use a ***directional antenna*** to help determine the direction of the signal source.

Once the participant nears the hidden transmitter, one problem many encounter is the transmitted signal is so powerful that determining the signal direction becomes very difficult. At that point, either the operator must find creative ways to hide the receiver from the signal source, or he / she must somehow reduce the strength of the signal into the receiver. The latter is the job of an ***attenuator*** (signal power reducer).

In this case, because our attenuator design requires a battery to power its circuit, we refer to it as an ***active*** device. Also, while your radio is tuned right on the 2-meter frequency, the attenuator allows you to adjust the incoming signal at an ***offset*** of the target frequency to further attenuate its strength. The idea is to convert the strong on-frequency signal into a weaker off-frequency signal, especially as the hunter approaches the fox. This project is based off one posted by the Dupage Amateur Radio Club W9DUP, who got it from Joe Moell KØOV.

Parts list

One enclosure 100 mm x 68 mm x 50 mm
One 2″ x 3″ prototype circuit board
One 5 kΩ audio taper pot (6 mm shaft)
Two 2.2 kΩ ¼ W resistors
One 4.7 kΩ ¼ W resistor
One 470 Ω ¼ W resistor
Two 470 pF ceramic capacitors
One 4.7 nF ceramic capacitor
Two 3″ RG-316 coaxial cables
One SMA-M to BNC-M jumper / adapter
6″ 22 AWG hookup wire
Two BNC-F panel-mount connectors
One TPDT switch
Four each M3 pan head screws and nuts
Four 3.1 mm x 6 mm x 6 mm standoffs
One 4.0 MHz oscillator
One red LED
One L7805CV regulator (+5V)
One 1N4148 diode
One 9V battery connector
One 9V battery
Small-gauge heat shrink tubing

Construction

To make things a little easier, let's focus on two parts to this project : the enclosure and the circuit board. Afterwards, we'll test the attenuator and find out whether our soldering skills are good enough to make the device work as expected. And if it doesn't work as well as we'd like, we'll have to trace all our connections to be sure they match the schematic. I've labeled all the circuit board connections, to help you more easily trace the wiring if needed.

DIY, continued

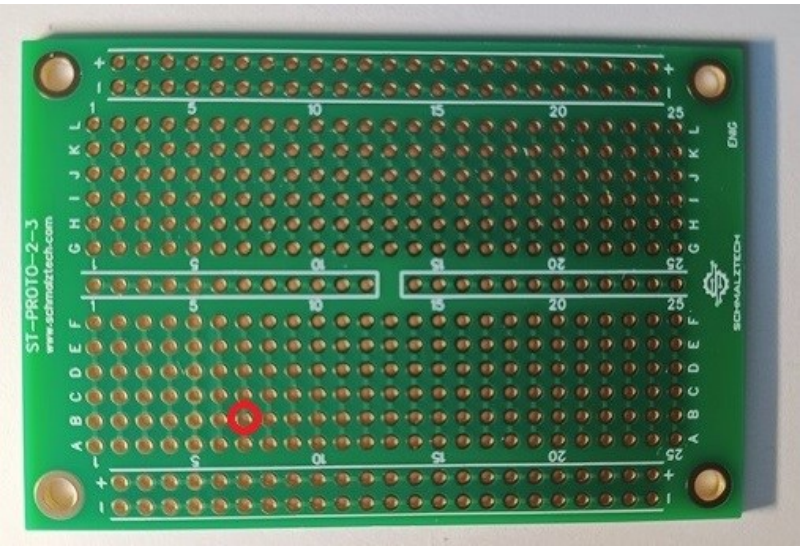
Foxhunt 2-meter active offset attenuator

Enclosure assembly

Lay the circuit board on the bottom inside the enclosure for a template, and drill a 1/8″ hole in the enclosure through each of the large corner holes. On each end of the enclosure, drill a 3/8″ hole 3/8″ from the lid for each BNC connector. On the lid itself, drill a ¼″ hole for the switch, a tiny 7/64″ hole for the switch mount, a 3/16″ hole for the LED, a 5/16″ hole for the potentiometer, and a tiny 7/64″ hole for the potentiometer mount, as shown:

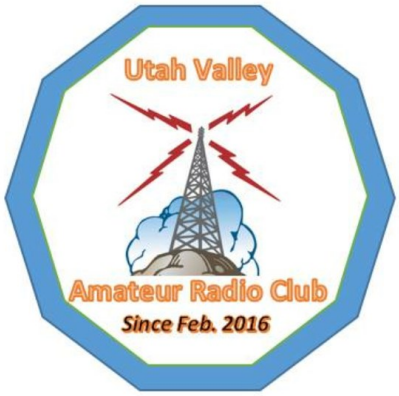
Circuit board identification

To make the assembly a little easier, let's identify the connection points laid out on the silk-screen coordinates on the prototype board. I'll refer to the side of the board showing in the photo below as the ***component side***, and the opposite side of the board as the ***solder side***. This way, you'll insert the leads (wires) of each component through the holes of the component side, then solder the leads to the board on the solder side. To ensure we're on the same page, I've circled in red the hole for B7 on the component side.



DIY, continued

Foxhunt 2-meter active offset attenuator



The remaining six are a little trickier to identify, so for those let's reference the "top" and "bottom" orientations of this photo. Eventually, we'll connect the top "+" and bottom "+" rows ("buses") together. We'll eventually connect the top "–" and bottom "–" buses together as well. This way, when we reference hole "top 13–", it's the hole of the top "–" bus at column 13. Finally, there are two center buses, the left center bus and the right center bus, which we'll reference by "center 21" for the hole in the right center bus at column 21.

Circuit board assembly

Solder the components onto the circuit board (not in any particular order) by placing their leads into the component side, then soldering them to the board on the solder side.

- 4 MHz oscillator : pin 1 (has a dot on top) = E22, pin 7 = I22, pin 8 = I19, pin 14 = E19
- 7805 regulator : input = B17, center = B18, output = B19
- 470 Ω resistor : between K7 and 7+
- 470 pF capacitor : between I8 and I10
- 470 pF capacitor : between I13 and I15
- 1N4148 diode : anode = H10 and cathode (stripe) = H13
- 2.2 kΩ resistor : between J13 and 13–
- 4.7 nF capacitor : between K17 and K19
- 4.7 kΩ resistor : between E17 and G17
- Red wire : between top 4+ and bottom 4+
- Black wire : between top 2– and bottom 2–
- Black wire : between top 22– and K22
- Black wire : between A18 and bottom 18–
- Black wire : between top 9– and the LED short leg
- White wire : between G7 and the LED long leg
- Blue wire : between D10 and potentiometer center leg
- Yellow wire : between I17 and potentiometer right leg
- Black wire : between top 10– and potentiometer left leg
- Left coax shield : top 8–
- Right coax shield : top 23–
- Battery black wire : bottom 5–

Face the rear of the switch such that the toggle can flip upwards or downwards. Assuming that "up" means "on" (both the tab and the notch are down), wire it as follows:

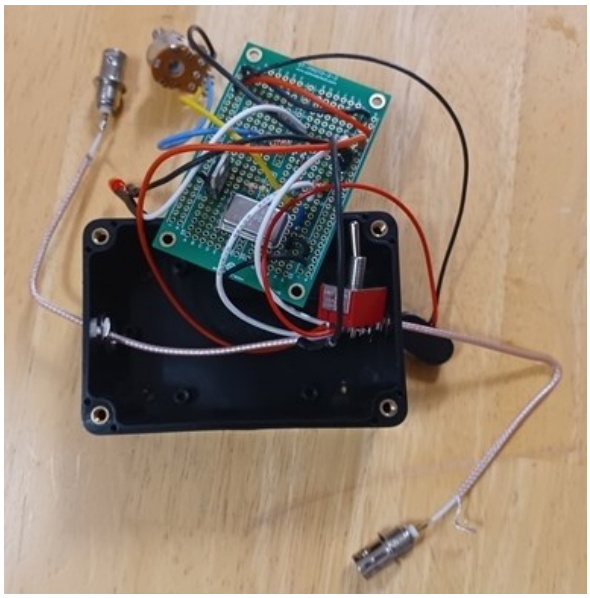
- White wire : between J8 and the switch lower center
- White wire : between K15 and the switch lower right
- Left coax center : switch middle center and switch upper right
- Right coax center : switch middle right
- Red wire : between top 6+ and the switch lower left
- Battery red wire : switch middle left

Slip each coax through the BNC connector hole before soldering to the connector. Apply heat

DIY, continued

Foxhunt 2-meter active offset attenuator

shrink tubing to hide the shield connections, then install the BNC connectors to the enclosure. Assemble the LED, potentiometer, and switch onto the cover, attach the battery, then apply the screws to the cover.



Plug a BNC male cable from your antenna into the bottom BNC female connector. Plug another from your radio into the top BNC female connector. ***Never transmit from the connected radio.*** Enjoy.

Summary

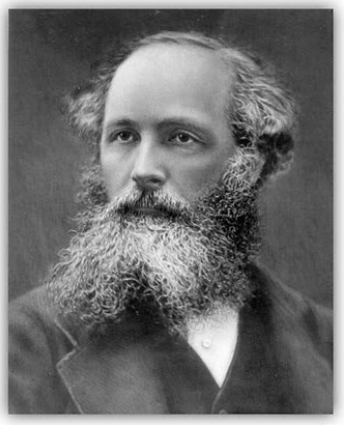
When searching for a hidden transmitter, the signal can be strong enough to overwhelm your radio receiver, once you approach the transmitter. A signal attenuator can be useful to reduce the strength of the incoming signal, to better detect its direction. While a passive attenuator can perform the function to a point, an active attenuator can often do much better. You can build your own attenuator with some basic soldering skills and a little patience.

Noji Ratzlaff, KNØJI (kn0ji@arrl.net)

Living in the Past

Historical perspective

The father of electrical engineering



To say that James Clerk Maxwell was a mathematician, a physicist, or an engineer would be the profound understatement of his century. Most modern physicists regard Maxwell as the undisputed father of electromagnetic theory.

In 1831, James was born in Edinburgh, Scotland, and was eventually enrolled at the Edinburgh Academy, where he excelled in drawing, English, poetry, and scripture study. His aptitude for mathematics was not recognized until he was 13, when he won the school's mathematical medal. By age 14 James had submitted his first scientific paper, which improved on dual-foci curve-fitting that was proposed by none other than Rene Descartes, the famous philosopher and mathematician. At age 16 he was enrolled in the University of Edinburgh, and by 19, to the University of Cambridge. By age 25, James had graduated, was made a fellow, and transferred to Marischal College in Aberdeen, where he was made a full professor, at least 15 years younger than any other.

At King's College, which became part of Aberdeen, James was able to devote his time to the study of hydrostatics, viscosity, optics, and heat by mathematical means. It was here that he made his greatest discoveries in the fields of electricity and magnetism. In 1861, Maxwell started with the findings of Michael Faraday and reduced all of the current knowledge of electricity and magnetism into a linked set of twenty differential equations, and subsequently published *On Physical Lines of Force*, which became one of the most historically significant publications in physics. Today, Maxwell's name is synonymous with the famous equations that bear his name (Oliver Heaviside later revised them using his newly formed vector calculus into the four with which we're currently familiar):

$$\nabla \cdot \mathbf{E} = \frac{\rho}{\varepsilon_0} \qquad \nabla \cdot \mathbf{B} = 0 \qquad \nabla \times \mathbf{E} = -\frac{\partial \mathbf{B}}{\partial t} \qquad \nabla \times \mathbf{B} = \mu_0 \left(\mathbf{J} + \varepsilon_0 \frac{\partial \mathbf{E}}{\partial t} \right)$$

Here are a few of his many other achievements and advances:

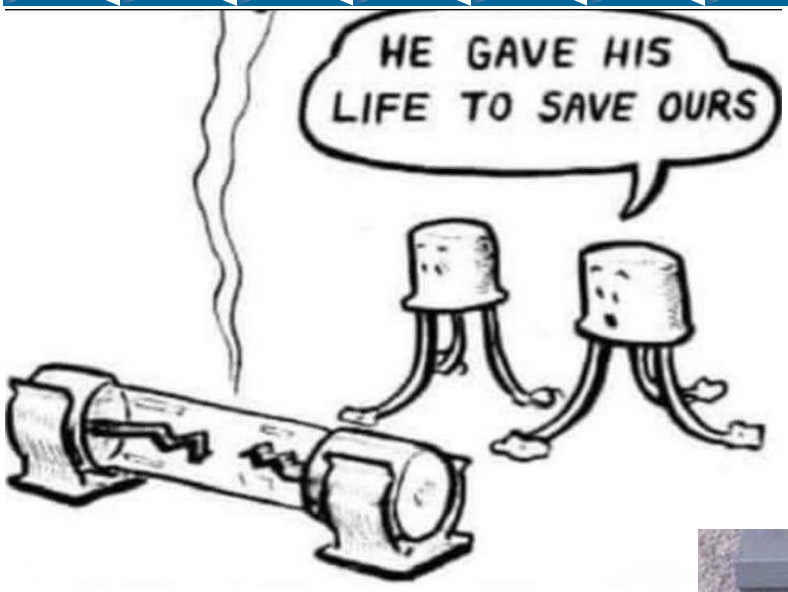
- First color photograph
- First to identify the composition of Saturn's rings (confirmed by Voyager flybys in the 1980s)
- The kinetic theory of gases (statistical mechanics), displacement current, electrostatics
- Stress function, speed distribution, coupling, diffusion, dimensional analysis

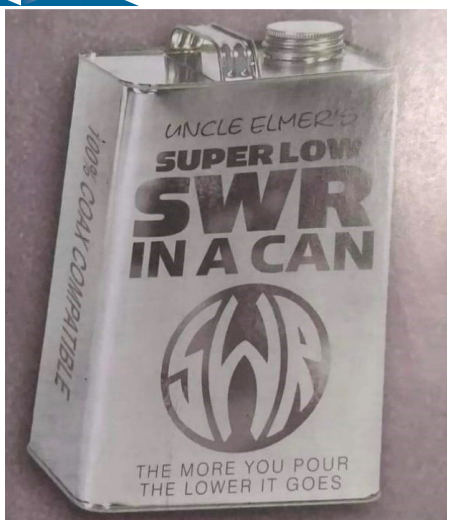
On the centennial of Maxwell's birthday, Albert Einstein described Maxwell's work as "the most profound and the most fruitful that physics has experienced since the time of Newton." Later, when Einstein visited the University of Cambridge, he was told that he had done great things because he stood on the shoulders of Newton. Albert replied, "No, I don't. I stand on the shoulders of Maxwell." Today, much of our technological knowledge, including radio, stands upon the shoulders of James Clerk Maxwell, the father of electrical engineering.

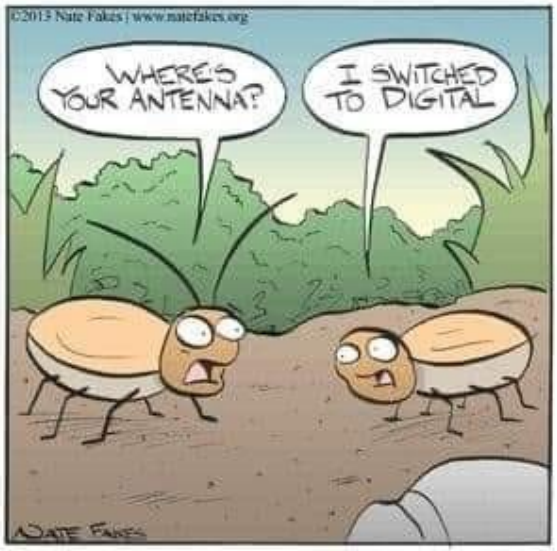
You can read more about Maxwell in the *Famous Scientists* and *Biography*.

Side of Bacon

A little ham humor







For Your Insight

Information you could use

Club meeting format

Here's the usual agenda for club meetings, at the Orem City Council Chamber Room, 56 N State St:

Talk-in frequency on the club repeaters

6:30 pm : Eyeball QSO

socialize / put faces with call signs

radio programmers available to help you

6:45 pm : Call the meeting to order

meeting lineup (agenda)

announcements / calendar / new hams

7:00 pm : Discussion / presentation

7:45 pm : Door prizes

7:55 pm : Dismiss and disassemble

8:00 pm : *Club QSY* to a local eatery

Something you'd like to see at the meetings?

Thanks to Heath Stevenson for making our monthly meetings possible!

Monthly meeting help

We're grateful for the volunteers who help with various tasks that make our club night just that much more friendly and useful to everybody. Monthly, we need help with

programming radios (thanks, Ralph!)

taking photos or videos during the meeting (thanks, Joe!)

operating the talk-in radio

setting up tables and chairs (thanks, Heath!)

Lynx

Websites for your education and leisure

Ham Radio Equipment
Ham Radio Nets
Radio Programming
Net Training Topics
76ers Group and UVARC Group pages
New Ham Page

Send your input to ***uvarcshack@gmail.com***

Test your knowledge

General and Extra review (answers next page)

G6AØ4 : Which of the following is an advantage of an electrolytic capacitor?

A. Tight tolerance
B. Much less leakage than any other type
C. High capacitance for a given volume
D. Inexpensive RF capacitor

E6DØ3 : Which of the following is an aspect of the piezoelectric effect?

A. Mechanical deformation of material by the application of a voltage
B. Mechanical deformation of material by the application of a magnetic field
C. Generation of electrical energy in the presence of light
D. Increased conductivity in the presence of light

Calendar

What's happening
(times are Mountain Time)

Provo Ham Exam Sessions

Provo Fire Station #2, 2737 N Canyon Rd

Sign up at HamStudy.org/sessions/nv7v

Wed 16 Aug, 7:00 to 8:30 pm

Sat 16 Sep, 2:30 to 5:00 pm

Wed 20 Sep, 7:00 to 8:30 pm

Wed 18 Oct, 7:00 to 8:30 pm

Sat 21 Oct, 2:30 to 5:00 pm

*Email **uvhamtest@gmail.com** for info*

Provo One-day Technician Courses*

Third Saturday Monthly at 8:00 am

Provo Fire Station #2, 2737 N Canyon Rd

** September through April*

2023 Orem Ham Radio Courses

Sign up at psclass.orem.org

Technician : Sep 17, 24, Oct 1, 8

Club Meeting Calendar (6:30 pm)

On YouTube Live, and Facebook Live

August 1	September 5
October 3	November 7 *
December 5*	January 2

† *Ham Radio Fair, Pheasant Brook Park*

* *At the Orem Friendship Center*

Regular Nets

UVARC Family Net, Sun 3:30 pm, 146.780

NE UC ERC Net, Sun 9:00 pm, 147.540 (s)

Health & Fitness Net, Mon 7 pm, 146.780

UVARC Ladies' Net, Tue 7 pm, 146.780

DMR Utah Net, Wed 6 pm, TG 3149, CC 1

Utah 76'ers, Wed 7 pm, 146.760

UVARC HF Net, Wed 9 pm, 28.345 / 7.220

UVARC New Ham Net, Thu 7 pm, 146.780

CERT Ham Net, 2nd, 4th Thu 8:pm, 146.780

Utah County 6-meter Net, Fri 8 pm, 50.140

Family History Net, Sat 8 pm, 146.780

See a larger list of nets at noji.com/nets

Upcoming Contests

European HF Championship

6 am to 6 pm Sat Aug 3

North American QSO Party (NAQP), SSB

Noon to midnight Sat Aug 17

State QSO Parties

Sat Aug 24 : HI, KS, OH, Islands

State QSO Parties

Sat Sep 21 : TX, NJ, NH, AL, IA, WA

See a larger list at contestcalendar.com

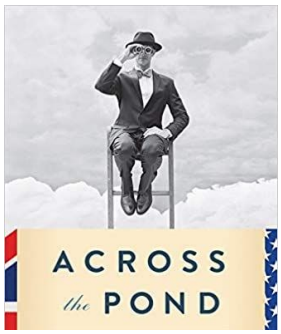
Answers to *Test your knowledge*

G6AØ4 : **C** (High capacitance for a given volume)

E6DØ3 : **A** (Mechanical deformation of material by the application of a voltage)

Across the Pond

That is, the Utah Lake 'pond'



Eagle Mountain ham radio activities

A list of amateur radio activities near Eagle Mountain, organized primarily by Dave Becar KI6OSS. Unless otherwise noted, all these activities will be held at the Eagle Mountain City Hall, 1650 Stagecoach Run. Please contact Dave at **ki6oss6365@gmail.com** to register for any of the classes or exams, for any additional information, or questions in general.

September 2024 Technician Course

Thu 29 August, 7 to 9 pm
Thu 05 September, 7 to 9 pm
Thu 12 September, 7 to 9 pm
Thu 19 September, 7 to 9 pm
Thu 26 September, 7 to 9 pm

Ham Radio Exam Sessions

Sat 21 September, 10 am (Swap Meet)
Sat 28 September, 10 am
Open to all, for any license class

Ham Radio Nets

Eagle Mountain ECT Net
Sundays, 9 pm 147.220+ MHz (151.4 Hz)

Eagle Mountain Chimney Rock Stake
Sundays 8:30 pm 446.500 (s)

Eagle Mountain Central Stake
Saturday 8 pm 145.650 (s)

Vendors

For your convenience

Pockrus Joystick J-pole

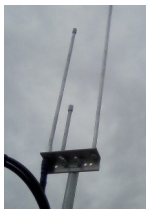
$30, open-stub aluminum half-wave, dual-band J-pole antenna

$40, 6-meter dipole, $20 for the 220 MHz (1.25 m) antenna

by Carl Pockrus, WE7OMG (email omgantennas@gmail.com to order)

Half-wave performance, solid construction, weather-proof, low wind-load

Probably the best-performing outdoor antenna you can get for the price



Super-Elastic Signal Stick

$22, vertical quarter-wave flexible antenna

by Richard Bateman, KD7BBC, of *SignalStuff* (and maker of *HamStudy*)

Super-performing antenna for your HT (handhold transceiver)

Visit SignalStuff and select SMA-Male, SMA-Female, or BNC

Ham Radio Podcasts v1.50

by Trevor Holyoak, AG7GX (email android@holyoak.com)

Stream podcasts (such as *100 Watts and a Wire*, *Amateur Radio Newsline*, *ARRL Audio News*, etc.) or download for later listening

For Android 4.1 and up (ad-free available for purchase)

Club Logo and Call Sign Embroidering

Want your call sign or name (or both!) embroidered on your shirt, your hoodie, your duffle? Or how about a club patch with your call sign?

by Glenna Gardner, WE7SEW (glenna0354@gmail.com or text 801-592-2503)

Call sign or name = $5, Both = $8, UVARC patch = $5, Patch with call = $9

Portable Aluminum J-pole

$60, sectioned, open-stub aluminum half-wave, dual-band J-pole antenna

by Stan, KJ7BDV and Kent, N7EKF (email skantenna@yahoo.com for info or call 801-372-7260)

Complete antenna breaks down into a compact 2″ x 6″ x 12″ package weighing only 3 lbs, perfect for backpacking and portable work where you really need a good 2-meter antenna

HamBadgers

Amateur radio name badges and other products

$10, official UVARC ham radio name badge with the club logo

Visit Ham Badgers and select Ham Radio Clubs > Utah Valley Amateur Radio Club

Email Eric Palmatier at hambadgers@gmail.com or call 919-249-8704

Where everybody knows your call sign

Utah Valley Amateur Radio Club
PO Box 1288
Orem, Utah, 84059-1288 USA

K7UVA
Phone/Text: 801-368-1865
Email: k7uva@arrl.net

Repeaters: 146.780–, 100.0
448.200–, 100.0 224.560–, 100.0
145.250–, 100.0 448.225–, 100.0
Newsletter input?
Email uvarcshack @ gmail.com
Need help?
Email uvarcelmer @ gmail.com

[See all our newsletters on uvarc.club]

We are the *Utah Valley Amateur Radio Club*, a 501(c)(3) non-profit (EIN 81-360-6416) Utah corporation (9752825-0140) that was organized in an obscure Orem fire station on 02-05-2016 to provide amateur radio enthusiasts in Utah County and surrounding areas a way to gather and discuss all things ham. Our primary purposes are to provide a local amateur radio resource, help new hams in their new-found adventures, and to give more experienced hams a reason to share their wealth of knowledge and wisdom in a friendly atmosphere of fellowship. We're an ARRL Affiliate and work in cooperation with the Utah VHF Society, but are not subsidiary to them, to ARRL, ARES, or any other organization, although many of our members and leaders might also belong to the same.

This newsletter is copyrighted and published by the Utah Valley Amateur Radio Club, and its purpose is to convey the tone and temperament of the club, to inform and entertain its members, and to entice the rest. To join, go to uvarc.club/join, then sign up at www.facebook.com/groups/uvarc/ to stay informed. For more information about our club or about amateur (ham) radio in general, please email or text or call us.

More than just a club, we invite you to become part of a great ham radio friendship in Utah Valley

Our fearless leadership

Presidency

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Vice President..... Chad Buttars
Secretary.....Caryn Alarcon
Activities..... Michele Costello
Technology.....Trevor Holyoak

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Loren Chandler, WB1KE
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Heath Stevenson, KK7KOU
Orem City Emergency Manager

From all of us to you, 73